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ABSTRACT

A national survey of electronic data processing (EDP) skills and training needs involved 16 representative firms that employed EDP staff. Separate semi-structured interview schedules were used to interview 266 job holders and 63 managers with responsibility for EDP staff and computing systems. Findings indicated 67 percent of EDP staff had not completed or had no tertiary qualification. Not all previous education was related to EDP work. Most staff came directly from tertiary training or previous employment. Managers sought to recruit those with tertiary qualifications related to job needs, but the most important criterion was previous work experience. In recruitment managers had unrealistic expectations, had difficulty recruiting staff, and showed reluctance to hire inexperienced staff and train them on the job. In-house training was not always provided. Staff found training ill-timed or inappropriate for their needs. Half of the managers admitted that training in their firms was inadequate. Career prospects for staff were not good in about one-third of the firms. Managers said schools should offer more courses on the computer. Staff indicated employers should provide better orientation, on-the-job training, and a career path. (Appendixes include EDP position profiles and interview schedules.) (YLB)

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ELECTRONIC DATA PROCESSING

report on training

G.A. Wagner

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VOCATIONAL TRAINING COUNCIL 2

NATIONAL EDP SKILLS AND TRAINING

NEEDS SURVEY

by Graham A. Wagner

A Report Prepared for the EDP Working Party:
A Subcommittee of the Vocational Training Council's Micro
Electronic Technology Advisory Committee (METAC)

New Zealand Council for Educational Research

July 1984.

PREFACE

The field of business computing is one of the fastest growing areas of employment opportunity in this country. It also exemplifies the skill shortage problems created by rapidly changing technology as traditional training systems struggle to adapt to the new and volatile requirements of industry. If New Zealand is to take full advantage of expanding technology to promote its economic competitiveness and to achieve its social goals it will be necessary to invest at least as much in people as in hardware and software. For these reasons I welcome this report which will provide the essential base for developing training programmes to equip New Zealanders for the expanding employment opportunities that this technology offers.

As a first step in the investigation of training needs in this area the Council's Micro Electronic Technology Advisory Committee (METAC) established an Electronic Data Processing Working Party in 1982. The Working Party saw, as its first task, the need to conduct a thorough and objective analysis of the workforce to determine its geographic location, the numbers employed, the type of equipment used and the general occupational levels it encompassed. To achieve this a joint research project was commissioned in association with Otago University which culminated earlier this year, in the publication of Professor Ivan Jackson's report 'Computers in New Zealand: People, Education and Training'. This report identified some 4,000 employment opportunities in the business computing field and is now being widely used as a resource document by those interested in staff development for Electronic Data Processing occupations.

At the same time as Professor Jackson's research was being conducted the Working Party began to seek more detail on the actual skills required by those employed at various technical and non technical levels. Following a pilot study completed in May 1982 a full national survey was commissioned which has resulted in this report prepared for the Council by Graham A Wagner a senior research officer with the New Zealand Council for Education Research (currently a Fellow of the Institute of Education at the University of the South Pacific).

As a direct outcome of the case study research on which this 'National Electronics Data Processing Skills and Training Needs Survey' is based the Working Party has been able to develop twenty-eight job titles and position profiles which will no doubt assist with the effective identification of training problems specific to those newly defined and developing occupations.

A co-operative project of this type depends for its success on the efforts of a large number of people. I am most grateful to Mr John Watson, the recently retired Director of the Council for Educational Research for his help in the developmental stages of the project and for his willingness to commit Council staff and resources to it. Without the co-operation of the firms who permitted interruptions to staff time for interview purposes the project would not have been possible. I trust that the training results which flow from the final report will not only give them satisfaction but will also be of material assistance to them in the future. To Graeme Hale, the Executive Officer for METAC, who provided both the impetus and the necessary administrative support; to Graham Wagner for his thorough handling of the research; and to the members of the Electronics Data Processing Working Party and the Vocational Training Council research team I extend thanks and congratulations on this important achievement.

I believe this report will make a valuable contribution to the future development of training in the business computing and related fields.

Although commissioned by the Electronics Data Processing Working Party, monitored by METAC and published by the Vocational Training Council, comments and opinions contained in this report do not necessarily represent the opinions of Council or its constituent bodies.

Derek E Wood
Director
August 1984

RESEARCH TEAM

The research, which this report is based upon, was carried out jointly by the Vocational Training Council and the New Zealand Council for Educational Research. The pilot study was done by Ms. Josephine Lynch (VTC Training Consultant) in 1982 and the 1983 case studies by the following research team:

Mr. G. Patrick (VTC)

Mr. B. Robinson (VTC)

Mr. D. Honey (VTC)

Dr. D. Atmore (NZCER)

Dr. A. Gilmore (NZCER)

Mr. G. Wagner (NZCER - Research Manager)

ACKNOWLEDGEMENT

Although a research report of this kind must become my responsibility I would like to acknowledge the help and assistance of the following people: Mr. G. Hale and Ms. F. Lambert of VTC for their unstinting administrative support; the 1983 research team for their dedication and application, especially Mr. G. Patrick who ably assisted me during all phases of the research; Ms. A. Aitken and Mrs. E. Wagner for their respective efforts in quickly and competently collating interview data for the draft and final reports; and finally but not least, the Institute of Education (USP) for giving me the excellent services of Mrs. R. Nagatalevu who typed the final report.

G.A. Wagner

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1. INTRODUCTION

1.1 Background

This national report of an EDP Skills and Training Needs Survey was prepared at the request of the Eletronic Data Processing (EDP) Working Party, a sub-committee of the Vocational Training Council's Micro Eletronics Technology Advisory Committee (METAC). The Survey commenced in 1982 with a pilot study undertaken for the Working Party by Ms. Josephine Lynch, a researcher employed under contract to VTC. Ms. Lynch published her pilot study report in May 1982. Later that year, METAC approved a full scale national survey of EDP Skills and Training Needs along the lines of the pilot study.

In April 1983, a list of potential organisations was drawn up by members of the EDP Working Party as representative of the different kinds of business firms with EDP departments in New Zealand outside the State Services. After some discussion a final list of 15 firms was agreed upon and Mr. Graeme Hale, Executive Officer (METAC), sent out letters to the chosen firms seeking their participation in the national survey. These letters outlined the survey objectives and indicated that if the firms agreed to participate they would be contacted by the Survey Research Manager at an appropriate time in the near future.

With Mr. Hale's departure for overseas early in May 1983, responsibility for the planning, implementation and reporting of the research was given to Mr. Graham Wagner, a Senior Research Officer in Vocational & Adult Learning Research in the New Zealand Council for Educational Research. Under Mr. Wagner's direction the survey of selected firms commenced in May 1983 and concluded in November 1983. During this period, fifteen firms with small to large EDP departments in the North and South Islands, from Dunedin to Auckland were surveyed, thousands of kilometres travelled by researchers and countless hours of interviewing and report writing undertaken. Details of the survey objectives, methodology and results follow.

1.2 Objectives

Towards the end of 1981, the EDP Working Party of METAC agreed that it should commission an EDP Skills Analysis and Training Needs survey within one EDP organisation in New Zealand. Employing a case study approach the survey had

the following objectives:

- To determine the skills and knowledge required by EDP staff;
- To identify the methods by which EDP staff have achieved competency in their jobs;
- To establish the career pathways available to EDP staff;
- To identify training needs of EDP staff as perceived by individual job holders and management.

Upon completion of this successfully executed pilot study, no substantial changes were needed in either the objectives or the methodology so it was agreed by METAC that the survey be extended to include other representative organisations employing EDP staff.

1.3 The Organisations : The Sample

As mentioned above, the EDP Working Party chose fifteen representative firms which employed EDP staff to add to the pilot study. Of the sixteen firms covered in this report, six were what might be called small with up to 10 people in the EDP section, two other firms employed between 10 and 20 people, two employed between 20 and 30 people, three employed between 30 and 40 people, one employed between 50 and 60 people, one between 100 and 110 people, and one between 140 and 150 people. The firms selected to take part in the survey (including the pilot firm) were chosen for their size, geographical location and industry type.

The 16 case studies classified by type and region with the numbers interviewed and the numbers in the EDP sections in each firm are given in the following Table:

TABLE ONE: Distribution of Firms and Sample Interviewed

	No. interviewed	No. in the EDP Section
South Island (4)		
Engineering firm	20	31
Small retail organisation	4	4
Manufacturing firm	12	13
Insurance company	19	27
South Island Total :	57	75

North Island (11)		
Large transport organisation	44	150
Small tertiary teaching institution	8	8
Small freight transport company	8	9
Large software bureau and manufacturer	18	110
Small regional software bureau	6	6
Metropolitan local body	19	20
Multinational importing and distributing organisation	24	30
Small accounting firm	7	8
Large manufacturer	36	40
Large computer sales and service organisation	38	76
Large EDP banking services network	58	58
North Island Total :	266	515
Both North and South Island (1)		
Small computer network	5	5
Overall Total :	328	595

In total, 328 people were interviewed in the sixteen firms listed above. Of these 266 were job holders and 63 were managers with responsibility for EDP staff and computing systems. A full range of the different classes of work that those interviewed were engaged in, or responsible for, is detailed in Appendix A. The data from the interviews is contained in Sections 2, 3, 4, 5, 6, and 7 of this report.

Copies of individual firms case studies have been sent to each organisation involved in the research for their own use and remain the property of each firm. The case studies have not been released for public scrutiny because they could contain data which may be sensitive. Hence, it was agreed by the EDP Working Party that the individual firms' case studies should remain confidential. However, a genuine request for more information on the case studies should be directed to the Vocational Training Council who will, in consultation with New Zealand Council for Educational Research and the firm concerned, decide whether individual case study data can be released.

1.4 The Research Methodology

The principal research method chosen for this Survey was the case study approach. The case study method has the advantage over the familiar questionnaire survey in that it provides a detailed indepth investigation of a particular organisation resulting in a rich, detailed and well-organised picture of the firm. Depending upon its purposes, the case study can focus on specific factors such as the actual skills required for EDP work or on the total EDP work scene. Furthermore, compared to questionnaire studies which tend to examine a small number of variables across a large sample of units, case studies tend to examine a small number of units across a large number of variables and conditions. The case study is particularly useful in providing background information for planning major investigations or developments in vocational training.

One of the weaknesses of using a single case study is that by concentrating on one firm it could be said that this firm was limited in its representativeness of the overall scene and any generalisations made would be hazardous. To overcome this weakness the EDP Working Party included a comparatively large number of case studies in this study and made special efforts to see that the case studies were representative of different industry-types.

Furthermore, case study research can be criticized for its vulnerability to subjective biases by interviewers and reporters. To overcome this weakness, all interviewers used in this study were trained and guided by an experienced researcher familiar with this kind of case study research, and the data collected was interpreted and summarised by two independent evaluators prior to its inclusion in the final report.

The principal data collection instruments used in the case studies were two separate semi-structured interview schedules designed for: (1) job holders; and (2) a shorter version for managers (see Appendix B). As can be seen from Table One above, it was possible in the smaller firms to interview all EDP staff available on the day, but in the larger ones the researchers were required to use a stratified random sampling process for selecting people for interviewing. Usually the selection process was based upon the advice of the firm's personnel or EDP manager(s). Attempts were made to see that all unique, as well as typical, positions were investigated. Where there were a large number of data entry operators, for example, the researchers would aim to interview one

out of three of these selected at random. In a firm which had well in excess of 100 EDP staff it would have been unnecessary and time-consuming to interview everyone (the researchers own manpower and financial resources were a real limitation) so the random sampling compromise was worked out with the firms liaison person. The researchers made checks to see whether they had reached all key people in EDP sections by cross-checking with staff as they interviewed. During the course of this survey there was no evidence that the research team did not have access to key, or representative, EDP people in the case study firms.

Prior to the commencement of the 1983 phase of this survey, all interviewers were given three training sessions by the Research Manager. In addition, the first 1983 case study was used as a training exercise for the interviewers who, although graduates with varying degrees of research experience, needed instruction and practice in interviewing technique. Close working relationships among interviewers, and constant oversight of their work by the research manager, ensured that a uniform data assessment approach was adopted for both the collection and compilation of data.

Soon after interviewing was completed each firm was presented with a company report which was a firm-specific version of this national report. This exercise enabled the interviewers (who also wrote the firms reports) to check constantly on the uniformity of their approach and to seek confirmation that they were gathering essential information in relation to the objectives of the survey.

The procedure for contacting, interviewing and reporting back on the data gathered was established by Ms. Lynch in her 1982 pilot study. In general the same procedure was followed in 1983 although special care had to be taken in dealing with some firms who were cautious about exposing themselves to external scrutiny. Most firms were visited once by the Research Manager and given a formal presentation on what was involved in the survey. Only on one occasion did a firm refuse to take part in the survey after the initial presentation on the grounds that a new EDP manager had just taken over and was still settling in. Its place was taken by an equivalent industry-type organisation also selected by the EDP Working Party. One other firm declined to take part in the survey when VTC sent out the original approach letters, purporting it could not afford the time.

The procedure for dealing with the firms in the survey was as follows:

1. Letters were first sent by VTC to the General Manager of the firm seeking the firm's involvement in the survey and stating that the Research Manager would be in touch with him or the firm's EDP Manager, in due course.

2. The Research Manager followed up this letter by making telephone contact with the firm and in most cases ended up talking to the EDP Manager about the survey. A visit was then arranged to: (a) give a presentation about what the survey entailed, including sighting handouts to EDP staff and interview schedules; (b) offer a company report to offset the time given by the firm for the survey; (c) seek the firm's commitment to the survey, prior to leaving the first meeting; (d) make arrangements with the firm for the researchers to start the survey and to arrange a liaison person within the firm for the researchers to contact; (e) stress the confidential nature of the case study for that firm and to assure the organisation that the national report would not include information that would make identification of the firm easy.

   The presentations were, by and large, undertaken by the Research Manager in person, except in one case where a senior interviewer undertook the presentation in a South Island town after two firms agreed by telephone to take part in the survey. In another case the Research Manager conducted a tele-conference with a prospective firm in a provincial town, rather than undertake a visit, because of the cost and time involved.

3. Upon return to base the Research Manager made arrangements for interviewers to visit the firm by: (a) briefing them; (b) arranging travel; (c) providing a memo on travel and interview arrangements; and (d) upon completion of the interviewing, despatching of thank-you letters.

4. Upon completion of the company reports arrangements were made to have these: (a) draft typed; (b) posted to firms for comments; (c) amended, if necessary; and (d) posted out as final copies.

The interview schedules were the same as those used by Ms. Lynch in the pilot study with the exception that minor changes were made to some of the questions to clarify the meaning for interviewers and DP staff and in one case to 'tone down' the language in the section on career choices for a firm where morale was exceptionally low. These changes did not substantially influence the type of data collected.

When interviews were ready to start the interviewing team contacted the liaison person in each firm who gave them an interview timetable which designated the EDP staff for interview, the interview times, and the venues for the interviews. Each job holder was given about a 1-hour semi-structured interview and each manager was given a shorter ½-hour semi-structured interview. In most firms the sample included nearly all EDP's personnel who were available on the day(s), but in large firms, as mentioned above, because access time was limited and there were pools of similar job holders a stratified random sampling procedure was used to select interviewees.

Prior to the interviews, EDP staff were asked to give a break-down of their jobs showing what equipment they used, what knowledge was required in each job that they were responsible for, and what tasks made up their job (see Appendix C). During the course of the interview, the interviewers investigated related issues that arose from the leading questions posed in the semi-structured interview schedules. At the conclusion of the interviews in each firm the interviewers wrote the case study report. These summary reports were sent to the individual firms for comment. When the reports had been checked for technical accuracy, a final case study was written and two confidential copies mailed to the organisation in lieu of the time they had devoted to the survey. Feedback to date, on the firms reports, indicates that they have all been put to good use.

Because the national report was a summary of the information collected from 16 separate case studies it was important to ensure that the overall summaries and generalisations made were valid. To do this, the data was separately analysed by two different people, independently of each other, and their separate

interpretations were compared. Where differences occurred, both reinterpreted the data and if a compromise could not be agreed upon a third evaluator was asked to decide on the matter. This way the content validity of the report could be assured.

2. CHARACTERISTICS OF STAFF

2.1 Age and Sex

The most obvious characteristic of the staff in this survey was their youth. 57% of those interviewed were under 30 years of age and another 32% were under 40 years. Considering the age ranges among the sixteen firms, twelve firms had 50% or more staff under 30 years of age and of these 4 had 75% or more under 30 (2 small, 1 medium and 1 large firm).

Men outnumbered women by just over 2 to 1. In the total sample there were 225 males (69%) and 103 females (31%). In all but two of the sixteen firms men either equalled or exceeded the number of women. In the two firms where women were in the majority this was because the principal work of the organisations involved data entry operations.

One in five of those interviewed were managers. The survey showed that men held most of these positions (90%) even though women made up 32% of the sample. In only five firms did women hold any senior positions in the DP department. (The reader should bear in mind that the number of managers in the survey is inflated because of the sampling procedure used.)

In summary, the position in the sixteen firms under study was that staff were predominantly under the age of 40, with over twice as many males as females and most senior positions held by men.

2.2 Education

60% (N = 194) of the staff interviewed had some formal tertiary qualifications. Of these 33% had completed tertiary qualifications such as a degree or Technical Institute-type diploma or certificate and 27% had partially completed a qualification. In most cases the qualifications were not directly related to EDP work although this was not always regarded as a bad thing by managers especially when recruiting university graduates.

The range of degree qualifications of staff in the survey was extensive. They included the following:

- Ph.D's (Mathematics and Computer Science, Bacteriology)
- M.Sc's (Physics and other science subjects)
- M.A's (Spanish and other Arts subjects)
- B.Sc's (Electrical Engineering, Mechanical Engineering, Mathematics, Applied Mathematics, Physics, Chemistry, Biology, Botany, Economics and Computer Science - the most common)
- B.A's (Mathematics, English, Latin, Philosophy, Economics, Education, and Computer Science)
- B.C.Sc (5 people had this qualification)
- B.B.S. (Data Processing, Commerce)
- B.Com (Information Systems, Computer Science)
- B.C.A. (Business Administration, Computer Science, Accountancy)
- B.E. (Automotive Engineering)
- Scottish Diploma in Data Processing

The range of technical institute qualifications were as follows:

- NZ Certificate in Data Processing
- NZ Certificate in Science (Geology)
- NZ Certificate in Engineering (Telecommunications, Draughting)
- NZ Certificate in Commerce
- Certificate in Electronic Data Processing
- City and Guilds Certificate in CP and DP
- Radio Technicians Certificate
- Advanced Trade Certificate (Electrical)
- A.C.S.M.
- N.Z.I.M.

There were some staff with qualifications such as:

- O & C Certificate in Biochemistry
- Pitmans Junior and Intermediate Shorthand
- Chambers of Commerce Typing
- Computer Courses run by Consultants
- Armed Forces Computer Training
- Chartered Insurance Examination
- Banking Examinations

As mentioned above there were some staff (49) who had partially completed a qualification. Of these, almost half (22) were studying towards a NZCDP or institute EDP certificate. Others were studying towards the following: B.Com (Information Systems), LLB, B.Sc (Mathematics, Sociology, Computer Science, Information Science), BE, NZ Certificate in Science, ACA, NZCC, City and Guilds Certificate in Computer Programming and Information Processing, and NZIM. Some of those interviewed were taking the odd paper or short course in computing at either university or technical institute.

In terms of the range of qualification extant in the firms, five organisations had about 73% of their staff with either completed or partially completed tertiary qualifications. The rest ranged from a low 7% (a small data entry organisation) upto 66% (a large transport firm). All but two firms had 40% or more of their staff with tertiary qualifications of some kind. The two exceptions were small firms which had problems recruiting suitable staff.

Of the 40% that did not have tertiary qualifications a large majority had at least University Entrance or Sixth Form Certificate. This was also the highest qualification for data entry operators in the Survey.

2.3 Previous Experience

Just under two-thirds of the staff interviewed (61%) had had some previous data processing, or related, experience before joining their firms. (The firms ranged from 0% with experience to 100% with a median of 62%). Most had come directly from a tertiary training institution or similar type job. Very few

[illegible] directly from school, and a few had been recruited from within the firms.

Over one-third of the staff (36%) had been in their present jobs for less than one year and overall, about two-thirds (69%) had been in their current positions for less than three years. The remaining staff (31%) had been in their jobs for three or more years with fifteen years being recorded as the longest term for any one person in the Survey.

3. SKILLS AND KNOWLEDGE

3.1 Education and Experience Required

Managers in a majority of firms (9) expected to recruit people with a tertiary qualification (usually a degree or technical institute certificate) or with at least University Entrance. Frequent mention was made of the need for Programmers and Analysts to have a tertiary qualification such as a B.Sc in Computing Studies or a DP technical institute qualification. Data entry operators were generally expected to have keyboard experience and in only three small organisations was some other quality in new recruits seen as more important than academic qualifications.

Additional important job requisites mentioned by most managers were: knowledge of the firm, appropriate work experience, and maturity. In some cases managers said that work experience was more important than education. There also appeared to be a widespread reluctance to recruit school leavers summed up by one manager when he said he was "not interested in training school leavers".

Other personal characteristics required of new recruits were: communication skills, flexibility, initiative, self-motivation, ability to work with people, ability to work under pressure, self reliance (one manager expected new recruits to train themselves), adaptability, neatness, and good interpersonal relationship skills.

3.2 Recruitment

Managers in eleven firms, when interviewed, said that they experienced difficulty in recruiting suitably trained staff. Of the remaining firms, three indicated that it was policy to recruit from within the organisation, one indicated that "the supply exceeded the demand" (this was in Christchurch), and another firm said they had, in general, no difficulty recruiting people, but that people "with experience" were sometimes hard to find.

In fact, in about one third of all firms surveyed the difficulties in recruiting suitable staff stemmed from the desire to recruit those with previous experience. Managers in only two firms said that they were prepared to take on inexperienced

staff and train them on-the-job. This was because both firms were small and had a majority of data entry operators in the DP department.

About half of the firms (5) that said they had difficulty finding suitable staff sought high level analyst/programmers who would be able to use the firms equipment immediately upon entry and be able to see a project through to completion without having to have any on-the-job training. They hoped to employ staff with this level of experience from the 25 to 30 year old age group, suggesting that they were expecting of newly recruited tertiary graduates, not only a level of acceptable work experience, but also an ability to work with different systems. Furthermore, mention was made of the need for programmers/analysts to be adaptable, which may be due to computer firms supplying firms with new, and improved, hardware/software before the skills to adequately use these systems are available. Hence, management unrealistically seek young, bright, trained, and experienced persons to immediately fill this need.

3.3 Key DP Skills and Knowledge

A total of 28 basic position profiles covering all the main DP positions encountered in the survey are attached as Appendix A. The position profiles give the core "Tasks" (including the equipment used, skills required and knowledge required of the job holder) and if the position varies, in the range of tasks among firms, then "Common Additional Tasks" are also listed.

4. TRAINING

4.1 In-House Training

Firms differed widely on the matter of providing in-house training for its DP staff. Four firms provided no training, five provided regular training, and two (engaged in the provision of DP services) provided extensive in-house training courses, not only for their own staff, but also for their clients' staffs.

Where there is some form of in-house training, the firms surveyed often made use of IBM self-study courses or brought in outside consultants (usually from computer firms like ICL, IBM or Burroughs). In-house courses also included subjects such as: management, supervision, communication and accounting in addition to traditional DP type operations, systems and programming courses.

Where there was no in-house training in a firm the reason often given by managers was that they recruited only fully trained staff and therefore there was no need for this kind of training. This attitude mainly came from small firms.

4.2 Courses Run by Other Organisations

Eighty-eight per cent of the firms (14) surveyed sent their DP staff to outside training courses when the need arose. The two that didn't use outside training courses were small firms and recruited only already trained staff.

The major providers of outside training courses were ICL and IBM which suggests that these suppliers were endeavouring to see that their customers needs were being met. An overview of what they provided is as follows:

ICL Courses:

- Operations
- COBOL Compiler
- COBOL
- Operating Systems
- Advanced Business Principles
- Project Planning
- Project Leadership

- On-line systems design
- Telecommunications
- Systems Analysis
- Financial Modelling
- Presentation Techniques

IBM Courses

- CICS
- Systems Network
- CP Operations
- Structured Programming
- VSAM Applications
- Aspects of Programming
- Operations
- Data Entry
- Easytrieve
- Data Management
- Answer DB Mantis
- COBOL Programming

Other providers were: Honeywell, Data General, JCL, Hays Computer Systems, Burroughs, Systems Resources, Reynolds and Reynolds, SAS Institute, CINCOM, Computer Consultants, Datalease, J.P. Scotts, Universities and technical Institutes.

Generally speaking, most people were appreciative of the training, whether it be done by the organisation itself, an outside company, technical institute, or University. Difficulties arose, however, in some cases when the training was not matched to the job holder's needs. This often applied to in-house training as well as out-of-house training.

Criticisms of training tended to be directed towards outside packaged courses run by computer firms which in some cases were useful, but in most cases seemed to be a waste of time. Other criticisms were that the effectiveness of the training was that it came too late, it was pitched too high, and was presented in a boring fashion. The most common criticism was that the training did not go far enough and that in some cases, it was quite inappropriate for the job in hand.

The DP staff that appeared to be most favoured with outside courses were programmers, with analysts second, while data entry and junior staff were seldom provided with such training.

4.3 On-the-Job Training

Nine firms indicated that when they gave their DP staff on-the-job training it was done informally (as the need arose). This approach applied particularly at the data entry operator level and its success, as a training method, depended upon the experience, willingness, and availability of those able to inform.

When DP jobs became more specialised, a more formal approach to on-the-job training was adopted. There was a greater dependency upon self-teach courses, peer assistance, and training manuals, primarily because there was no one available, or knowledgeable enough to help staff under training. Some staff reported that they found manuals more useful than self-teach courses.

A commonly expressed view among data entry operators was that they felt they would benefit from more formalized training programmes. This view was not supported by a manager of a small DP department on the grounds that the limited number of staff did not warrant the time and expense in setting up, and running, an in-house training programme.

4.4 Effectiveness of Training

When interviewed, the staff were asked if they believed that their training within the firm had helped them to be more job-effective. Those in the majority of firms (11) said that they were adequately trained and in some cases acknowledged that they wouldn't have been able to do the job at all without training. In three firms the general opinion was that the training had been inadequate and in the remaining two firms the staff had confused and contradictory feelings about their training.

Where there were criticisms of training courses these fell into four main categories:

1. The training courses were not geared towards the particular needs of the DP staff (or individual),

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2. The tutoring staff were often ineffective, being good practitioners but poor teachers. A significant number of staff made mention of the need of teacher training for tutors: (This applied to the specialist computer firms as well as in-house managers and supervisors.),

3. Some of the self-study courses were judged boring,

4. Training courses were often badly timed and came after the need for them had dissipated.

In general, when it came to which type of courses were liked, those provided by ICL and the technical institutes were the most favoured.

4.5 Training Needs

While the general feeling among most DP staff was that they believed they were fairly well trained, in over three quarters of the firms (13) people identified some training gaps. In the remaining firms, staff said they felt sufficiently well-trained to be able to deal with any problems that arose. Again the latter were small firms that relied on recruiting experienced trained staff.

The identified gaps in training most often mentioned were:

- Interpersonal Communication Skills,
- Instructional Skill Training for Supervisors and Trainers,
- Communication Skills (Written and Spoken),
- Management/Supervision Skills,
- Project Supervision Training,
- Time Budgeting and Planning,
- Cash Flow and Budgeting Techniques,
- Information on New Technologies,
- Systems Analysis and Design,
- Training for Key to Disk Operators,
- Systems Programming,
- Systems Monitoring and Tuning,
- Program Testing,
- Systems Documentation,
- Hardware Interfaces and Low Level Languages,

- Background Information on Firms (Orientation),
- Keyboard Skills.

What those interviewed most objected to was having to "pick up the job as you go along".

4.6 The Managers' Views of Training

Not all managers in the firms surveyed were satisfied with the training available to DP staff. In half the firms (8) the managers described the training as 'adequate' while in another six firms the general consensus was that the training given was 'inadequate'. The remaining two firms did not provide any training, for reasons already mentioned, and consequently made no comment on this matter.

Even in those firms where the training was described as adequate the overall impression was that although in the first instance managers were quick to say that the training was adequate, when the interview progressed a little further, it became clear that they were really of the opinion that more training was essential for a more efficient operation. Some of the managers in the bigger organisations, admitted that even their basic training was at a minimal level and that there were some training gaps. Their position was summarised by one manager who said that the training they provided was "on-the-job, ad-hoc, and adequate". Nevertheless, later in his interview he admitted that training was done as a "last priority". The main problem for nearly all firms in this survey was that the pressure that is put on managers to "produce" meant that they had little time, if any, available for training.

In some firms, shift work interfered with training and, by-and-large, the present economic climate had limited outside training. Some firms had their own training consultants so that could mount in-house specialised training courses. However, even in the city, some managers reported that it was not always possible to get DP staff to Polytechnic and University run courses because of the time and distance involved. In one regional firm, the manager admitted that there was a lack of local training facilities (although the staff had reached an adequate level because they had trained themselves), but specialist help was only available at one of the metropolitan centres. Resources were too limited to allow staff to be sent to Wellington or Auckland for such training, he said.

The managers, by and large, agreed that Polytechnic type training courses were suitable for their needs and most firms encouraged their DP staff to enrol in these courses. In one firm, a manager commented that work experience was a better preparation than Polytechnic or University training.

Some managers could see no value in their staff learning such subjects as interpersonal relationships, communication, and management skills, because they were of the opinion that these were something that could not be taught. Managers in two firms mentioned the value of sending their staff overseas for specialist training. This, they said, would provide individuals with better career prospects as well as give them the kind of training not available in New Zealand.

Training gaps mentioned by managers included:

- Systems analysis
- Programming techniques
- Training resources

This short list is a notable contrast to the staff's list of gaps in 4.5.

5. CAREER DEVELOPMENT

5.1 The Staff's Views

Some of the firms surveyed could offer their staff promotion prospects. Six firms, both large and small, satisfied 60% or more of their staff by providing them with the opportunity to proceed along a clearly defined career pathway. In one small data network organisation there was no real career opportunity, apart from the job itself, which, however, proved satisfactory to the incumbents who knew where they stood.

In five firms (two large and three small), it was clear that the staff did not feel that the company adequately catered for their career aspirations, and about 1 in 3 saw no advantage in staying on indefinitely. In one of these firms there was dissatisfaction among younger staff members in the operations area, over the promotion of senior people, while in another organisation, because it was controlled from overseas, there appeared to be few senior positions available for New Zealanders.

Even while DP staff in three firms were quite clear about the career paths available to them, they all considered that better prospects came from moving outside their firms into other firms. Generally speaking, those who were considering leaving were the younger people who did not believe that their firms could offer them the same training and experience that they would require one day to take over senior positions in the DP area. In contrast the staff in 4 small firms said that they had no intention of leaving, being quite happy as they were.

5.2 The Managers' Views

When the managers were asked whether there were adequate opportunities for staff development within their firms the managers in nine firms responded that they considered there were good prospects. In another six firms the managers said that the opportunities were not satisfactory while in the remaining firm, by virtue of its limited data entry role, the manager made it clear to his four staff that any staff development opportunities lay outside the firm.

Surprisingly though, in two of the firms, while the managers said that staff development opportunities were inadequate a majority of the staff considered that they had clear career paths and good promotion prospects open to them. In another firm, the matrix type organisational system made it difficult to provide adequate staff development opportunities in some sections because of the company practice of "capitalizing on those with flair".

The larger firms appeared to be able to offer better staff development opportunities than the smaller firms. Some managers could not perceive staff development except within their own DP sections, while other managers, in the larger firms, admitted that total career development within the context of the whole firm was something that was lacking.

In some firms staff development was seen as synonymous with personal development rather than in terms of promotion and higher salaries (the staff view). Managers in some of the smaller firms qualified their comments that there were clear career pathways for DP staff by saying that this depended upon attrition, or company growth and expansion. Furthermore, when it came to who might be promoted, managers in most firms agreed that programmers had better career prospects than, for example, data entry staff who were regarded as being "less career oriented". Although data entry operators were primarily females one manager volunteered that he preferred to employ females "because of their stickability". He didn't expect them to be career orientated, he said, but he would support them if they desired it.

6. IMPROVING TRAINING AND EDUCATION

All staff interviewed in this survey were asked if they had any suggestions about improving training in schools, in technical institutes, and within the company (The Managers' Views are included in Section 4.6).

6.1 At School

In most firms (14) the staff mentioned that schools should offer computer awareness courses to provide pupils with "hands on experience" and help demystify the computer (2 firms). Staff in another two firms even went so far as to say that a Form 3 to 7 integrated computer studies course could be introduced into the curriculum and that this subject should be offered for School Certificate and University Entrance.

Additional suggestions for inclusion in the school curriculum were: keyboarding and programming skills (6 firms), although some staff in 3 firms believed that computer languages should be left to the tertiary teaching institutions; business oriented courses, especially covering the role of the DP staff, and including "field trips to bring the subject alive" (2 firms); courses in logical thinking, problem solving, management, and business skills (3 firms). Some staff pointed out that there was a need for greater emphasis, in the schools, upon basic skills such as reading, writing and mathematics.

Mention was made, in three firms, of the need for teachers in secondary schools to have better training in computing techniques. It was also suggested (3 firms) that the Department of Education had a responsibility to set out the aims and objectives of computer education so that there could be closer integration between the schools and the tertiary sector, and that the government should provide more resources for basic DP training in the schools. The need for better career information on DP was also mentioned a number of times during interviewing.

6.2 At Institutes

The principal DP qualification offered through technical institutes, polytechnics and community colleges in New Zealand is the five stage New Zealand Certificate

in Data Processing course. Other qualifications are local institute EDP certificates and short courses on specific subjects, such as BASIC and other programming languages, which are available from time to time. (Refer to Section 2.2 of this report for information on what those interviewed had in the way of educational qualifications).

Staff in nine firms commented that they thought that technical institute type training courses were, on the whole, commendable but surprisingly few had actually experienced one of these courses, (see Section 2.2). Nevertheless, the institutes were creditted with turning out reasonably well trained DP graduates and their courses were seen as useful and practical introductory courses.

When it came to making suggestions about improving institute training for computer personnel, staff in all firms had something to say. A summary of their comments is as follows:

- students in full-time courses need more work experience,
- tutors need to keep up-to-date,
- the incorporation of business knowledge in computer studies courses would be helpful,
- more systems design study was needed,
- block courses were too concentrated (on the other hand, year long courses were too long for some),
- there was a need for part-time sandwich courses with work experience between the blocks,
- there was a need to develop systems analyses training to higher levels of sophistication,
- courses were too limited and knowledge too specific (for example concentrating on subjects like COBOL to the exclusion of other business languages),
- there was a need for part-time and evening courses for those already working,
- a wider range of courses was needed,
- courses should include interpersonal relationship and writing skills,

- courses needed to be kept up-to-date,
- training needed to be more practical and business orientated,
- institute EDP long courses need to be based on a standardised national syllabus like the NZCDP.

6.3 At Universities

A majority of those interviewed gave information on how the universities might improve their training even though approximately only one in three had had university experience.

The most commonly expressed view of the value of a university education was that it made a person think. Another view was that its role was an esoteric and theoretical one where issues such as fourth and fifth generation and artificial languages could be discussed and investigated. One person thought that his BBS was a most useful qualification to have but most of the others, with either completed or partially completed degrees, were more critical of their university education.

Common suggestions for improving university training for DP personnel were as follows:

- make the courses more vocationally (business) oriented,
- provide a greater variety of courses in computer programming, especially at the year two and three levels,
- courses could be less scientific and more practical by including on-the-job work experience,
- more emphasis should be placed upon COBOL and other business languages,
- courses should be provided in advanced systems,
- more emphasis should be placed upon analysis and less on programming,
- introduce accounting and production control systems as part of the computer science degree,
- provide a better deal for part-time students by time-tabling courses to suit them,

- university teaching should be structured and error-free so that students experience an easy adjustment to real life when they leave,
- management training and training in interpersonal relationship skills should be included in computer studies courses,
- benefits would derive from the removal of computer subjects from the pure disciplines such as mathematics and physics into business faculties,
- encourage more people to train as business systems analysts.

In one firm some managers stated that if the universities did not provide them with suitably trained personnel, then the firms would hire professional consultants. It wasn't specified where these consultants would come from.

6.4 In the Company

As mentioned in a previous section, although staff generally felt that their training was satisfactory, in all but one firm (a small company), most of those interviewed had suggestions for improving training in the company.

By and large there was strong support for more regular training, although in the smaller firms it was recognised that there were problems associated with providing in-house training. In most cases staff did not appreciate having to train themselves or receiving training after they needed it. Furthermore there was a widespread belief in some firms that training was being neglected and that those doing the training needed training themselves.

Specific criticisms of in-company training most often mentioned were:

- need for more standardised training throughout all sections of the DP department,
- need for regular refresher training so that staff could keep up-to-date with new developments,
- more timely courses (when the training was most needed),

- more practical (less theoretical) instruction during training,
- need for more management training and the improvement of teaching techniques used by training personnel,
- some of the larger firms' staff mentioned a strong desire to get away from self instructional training methods and to have these replaced with formal training workshops run by outside training consultants,
- better job documentation and forward planning,
- in one large manufacturing company there was a strongly felt need for a training coordinator.

7. GENERAL COMMENTS

At the end of the interviews, DP staff were asked to comment on those aspects of their training and development that had not previously been mentioned. Staff in half the firms (8) took the opportunity to comment on what they liked and disliked about their present jobs.

Generally, staff believed that their employers should take on the responsibility for seeing that they were properly trained by providing a training budget, employing training staff, providing better orientation, job familiarisation, and formal in-house training courses, and providing a clear career path with promotion avenues. In addition, although not a widespread view, in three firms mention was made of the fact that women did not always appear to get a fair deal in the promotion stakes and that they had fewer career opportunities than men.

More specifically, the dislikes most often mentioned included:

- lack of communication between staff and management,
- company bureaucracy,
- company politics,
- low status of DP staff (2 large firms)
- non-competitive wages,
- lack of information on new products,
- task monotony,
- lack of appreciation of DP work (2 firms - one large, one small).

The things that staff liked most about their jobs included:

- variety,
- responsibility,
- intellectual challenge in problem solving (creativity),

- personal contact with other people,
- opportunity to develop technical knowledge and skills,
- satisfaction of working with computers.

8. SUMMARY

The sixteen representative case studies of business firms in this report have provided a reasonably consistent picture of the backgrounds, recruitment criteria, job skills, job knowledge, training and career development of typical EDP job-holders and managers in New Zealand. The information in the preceding sections, together with other recent complementary studies, should enable tertiary and vocational training institutions to determine appropriate training policies and programmes to meet the needs of EDP staff and their employers in the future.

The study draws attention to the following findings:

1. 57% of EDP personnel in the study were young people under the age of thirty years with all firms having 75% or more of their staff under the age of 40 years.

2. Males outnumbered females by over 2 to 1 and they also held 90% of all management positions.

3. The range of educational qualifications of EDP staff indicated that 67% had not completed, or had no tertiary qualification, and not all previous education was related to EDP work.

4. 61% of EDP experience (or related experience) came directly from tertiary training or previous employment.

5. 69% of those surveyed had been in their current job for less than three years with 36% less than one year.

6. Managers sought to recruit those with tertiary qualifications that were related to job needs, but the most important criterion was previous work experience.

7. 33% of all managers had difficulty recruiting staff but there was a great reluctance to take on inexperienced staff and train them on-the-job.

8. In recruitment, managers had an unrealistic expectation that they could find young, fully trained and experienced staff to work in their EDP departments.

9. This survey indicated that there were twenty eight identified EDP positions and that the wide range of skills and knowledge in these positions meant that data processing was a more complex vocational group than expected.

10. In-house training of EDP staff was not always provided by the employer, and when it was, then the likely provider was an outside agency like ICL or IBM. When training was done by the firm it was most likely to be 'ad hoc' or self instruction.

11. Because training was not often systematic or planned staff found that it was ill-timed or inappropriate for their needs.

12. On-the-job training was mainly of an informal nature (provided when the need was raised) and staff were often left to their own devices to work their way through training manuals.

13. Staff were often critical of training because it was not always relevant, well taught, challenging or appropriate. Although they generally thought they were well trained now, they also pointed to a long list of perceived training gaps.

14. Managers were more guarded than staff about the quality of the training in their firms (after all they were responsible for it) although half admitted that it was inadequate. It appeared that attempts to rectify this matter depended as much upon the motivation of individual staff members as it did upon the availability of outside training courses. Only three training gaps were mentioned but one, training resources, was

significant as it confirmed the staff view of the need for training.

15. Career prospects for staff were not good in about one third of the firms, while those in the rest depended mainly upon the availability of jobs within the department. Generally, young people had to move on to get the experience (and higher remuneration) that they desired.

Managers tended to agree with their staff on limited career prospects. Size had a part to play in career prospects, with the smaller firms offering the least, although this did not appear to worry the staff.

16. When it came to the staff views on improving the education of EDP staff, most said that the schools could offer more courses on the computer (including related subjects) and that the Department of Education should become more committed to this kind of preparatory education.

17. Degree courses in data processing were described as useful if they were practical and related to business practices.

18. Institute courses were judged of good value, although there were a large number of suggestions for improving this kind of training. Just as for universities, institutes were exhorted to be more practical and business oriented.

19. Company training, it was suggested, should be systematically planned and timely with less emphasis upon self-teaching and more emphasis upon formal courses.

20. Staff in half the firms made general comments to indicate that their employers should:

- take on more responsibility for training their staff,
- provide better orientation and on-the-job training for all staff,
- provide a clear career path.

21. Mention was also made of specific things that staff disliked and liked about their jobs.

POSITION PROFILES

1. Data Entry Operator.
2. Computer Operator.
3. Controller/Coordinator/Scheduler.
4. Operations Supervisor.
5. Programmer.
6. Analyst/Programmer.
7. Systems Programmer.
8. Systems Analyst.
9. Systems Accountant.
10. Auditor.
11. Technical Leader.
12. Database Administrator.
13. Design Authority/Data Administrator.
14. Data Processing Manager.
15. Software Support Advisor/Monitor.
16. Software Support Consultant.
17. Systems Consultant.
18. Sales Consultant.
19. Support Manager.
20. Marketing Executive.
21. Product Manager.
22. Services Manager (S/W Supply Co.)
23. Service Manager (Comp. Manufacture/Supply Co.)
24. Systems Software Engineer.
25. Support Engineer.
26. Systems Engineer.
27. Microprocessor Systems Designer.
28 Service Engineer.

1. Data Entry Operator

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Data Entry	Terminal	Keyboard	Commands, Programs used and appropriate procedures, formats.
2.	Check/Verify	Terminal	Keyboard	Commands, programs used and appropriate procedures, formats.
	COMMON ADDITIONAL TASKS			
3.	Identify/report faults.	-	-	Commands, programs used and appropriate procedures, formats.
4.	Clean Machine	-	-	Commands programs used and appropriate procedures, formats.
5.	Edit	Edit Machine	Checking, correcting	Edit Machine
6.	Supervise	-	Supervisory, organisation, administrative	Edit Machine
7.	Train, Educate	-	Training/inter personal	Edit Machine

N.B. In some organisations there are various levels of Data Entry Operator, e.g. Junior, Intermediate, Senior, and most organisations have a Data Entry Supervisor combining the above tasks with Supervisory duties.

2. Computer Operator

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Operate computer and peripherals.	Computer and peripherals.	Use Console, load/unload tapes, correct jams.	Operating system, programming language.
2.	Clean and maintain equipment.	-	Cleaning, change ribbons, paper etc.	Operating system.
3.	Report faults.	-	Identify faults.	Operating system.
	COMMON ADDITIONAL TASKS			
4.	Supervision, monitor output, etc.	-	Supervisory, organisation, administrative.	Operating system.
5.	Train/educate.	-	Training, interpersonal.	Operating system.
6.	Clerical.	-	Filing, etc.	Clerical.

N.B. In some organisations there are various levels of Computer Operator, e.g. Junior, Intermediate, Senior.

3. Controller/Coordinator/Scheduler

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Schedule work.	Terminal.	Organisation, clerical, identify the appropriate system application.	WFL, JCL, etc.
2.	Monitor network and rectify terminal or line problems.	Terminal manuals.	Communication.	Operating system.
3.	Liaison with other departments regarding runs.	-	Communication.	Operating department WFL, JCL, etc.
4.	Keep logs of batches, data entry, competition, operations. Check computer output, etc.	-	Clerical.	Jobs.
5.	Monitor security controls.	-	Clerical.	Files and system.
6.	Maintain manuals, system release advice, etc.	-	Clerical.	Files and system.

N.B. This position has a wide variation of tasks with clerical and operations dutes. The above is a balance of these features. A possible additional task is computer operating however.

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4. Operations Supervisor

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Supervision of Operators.	-	Supervisory, interpersonal, organisation, check output.	Operating system, machine use, user programs, WFL, JCL, etc.
2.	Day to day running of computer.	Computer	Solve disk errors, printer problems, etc, organisation.	Operating system, machine use, user programs, WFL, JCL, etc.
3.	Maintain equipment.	-	Identify/diagnose hardware and software problems.	Operating system, machine use, user programs, WFL, JCL, etc.

COMMON ADDITIONAL TASKS

4.	Train Operators	-	Training, interpersonal.	Operating system.
5.	Install new programs.	Terminal, program specifications.	Logical thinking, read and understand program documentation.	Procedure for installing new programs, exact requirements for a new suite of programs.
6.	Liaison with users.	-	Liaison/communication.	-
7.	Maintain stationery, supplies, etc.	-	Organisation.	-
8.	Implement JCL changes.	-	Editing.	WFL, JCL, etc.

5. Programmer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Maintain programs.	Program specifications, listings, terminal, manuals.	Keyboard, document design changes.	Programming languages, WFL, JCL, etc, standards.
2.	Write new programs.	Program specifications, listings, terminal, manuals.	Interpret specifications.	Programming languages, WFL, JCL, etc, standards.
3.	Test programs.	Program specifications, listings, terminal, manuals.	Set up test area, debug.	File structures.
	COMMON ADDITIONAL TASKS			
4.	Advise, train trainee programmers.	Manuals, terminals.	Interpersonal, training.	File structures.
5.	Technical support.	Program listings, JCL listings and dumps, terminal.	Locate errors, decode dumps.	File structures.
6.	Maintain testing facilities for use by all programmers.	Listings, manuals.	Ensure testing system is fool-proof.	JCL, WFL etc, files, systems.
7.	Supervision of programmers.	-	Supervisory, organisation.	All of the above.

N.B. In most organisations there are various levels of programming, e.g. Senior Programmer, Programmer, Trainee Programmer.

6. Analyst/Programmer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Maintain current programs.	Terminal, program listings, JCL listings, dumps.	Read dumps, diagnose problems, design, code, debug, liaise with users and operators, etc, document.	Programming, languages, WFL, JCL etc, what the program does.
2.	Develop new programs and systems.	Terminal, program listings, JCL listings, dumps.	Liaise with user or analyst design, specify code and document systems or programs.	Progamming languages, WFL, JCL etc, understanding of system.
3.	Test	Terminal, program listings, JCL listings, dumps.	Set up test area, debug.	Programming languages, WFL, JCL etc, understanding of system.
	COMMON ADDITIONAL TASKS			
4.	Advise, train programmers.	Manuals, terminals.	Interpersonal, training.	Programming languages, WFL, JCL etc, understanding of system.
5.	Technical support.	Program listings, JCL listings, dumps, terminal.	Locate errors, decode dumps.	Programming languages, WFL, JCL etc, understanding of system.
6.	Maintain testing facilities for use by all programmers.	Listings, manuals.	Ensure testing system is fool-proof.	JCL, WFL etc, files, systems.
7.	Supervision of programmers.	-	Supervisory, organisation.	All of the above.

N.B. In some organisations there are both Senior Analyst/Programmers and also Analyst/Programmer.

7. Systems Programmer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Maintain/enhance current systems and packages.	Manuals, terminals, reports.	Read dump, diagnose problems, design, code, document program/system changes, debug.	Programming languages, WFL, JCL, etc, operating system, (in-depth).
2.	Install and test new and enhanced systems and packages.	Manuals, terminals, reports.	Read dump, diagnose problems, design, code, document program/system changes, debug and test.	Programming languages, WFL, JCL, etc, operating system (in-depth).
3.	Technical support.	Manuals, terminals, reports.	Communication, advise users, operators and programmers.	Programming languages, WFL, JCL, etc, operating system, (in-depth).
	COMMON ADDITIONAL TASKS			
4.	Evaluate software and hardware.	Software/hardware specifications, manuals and technical information.	Liaison with user, evaluate feasibility, cost, write reports, communication.	Programming languages, WFL, JCL, etc, operating system, (in-depth).
5.	Advise and train users, operators, programmers.	Manuals, terminals, reports.	Training interpersonal.	Programming languages, WFL, JCL, etc, operating system, (in-depth).
6.	Design new systems.	Manuals, terminals, reports.	Read dump, diagnose problems, design, code document program/system changes, debug.	Programming languages, WFL, JCL, etc, operating system, (in-depth).
7.	Sales Support		Liaise with client communication/interpersonal.	Programming languages, WFL, JCL, etc, operating system, (in-depth).

7. Systems Programmer Continued .....

N.B. At Software Houses the position Software Consultant incorporates the same tasks as Systems Programmer only the responsibility is for the software of an outside user for whom the software has been designed. An additional task is therefore, sales support.

8. Systems Analyst

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Develop new programs and systems, design data capture, etc.	Manuals, documentation, design sheets, etc.	Prepare proposals, use flow diagrams, design system reports, forms, etc, liaise and communicate with user, interpret user requirements, prepare system specifications.	User environment/business procedures, programming languages, WFL, JCL, etc, operating system.
2.	Maintain/enhance current system.	Manuals, documentation, design sheets, etc.	Prepare proposals, use flow diagrams, design system reports, forms, etc, liaise and communicate with user, interpret user requirements, prepare system specifications.	User environment/business procedures, programming languages, WFL, JCL, etc, operating system.
3.	Ensure new and amended systems are tested.	Test files, manuals.	Set up test packs, test files and data, liaison, communication with programmers, etc.	JCL, WFL, etc, testing techniques.
	COMMON ADDITIONAL TASKS			
4.	Technical support.	Job specifications, listings, manuals.	Liaison, communication, investigate and resolve problems for users, programmers, etc.	Programming languages, WFL, JCL, etc, Operating system, Users environment, etc.
5.	Project management/ leadership.	-	Communication, management, project evaluation, cost, planning, e.g. critical path method.	Business procedures, User's environment and requirements.
6.	Advise, train programmers.	Manuals.	Training, interpersonal.	

N.B. In some organisations there were both Senior Systems Analysts and Systems Analysts and in one there was an assistant Systems Analyst. Project Leader is also a common title where project leadership is involved.

9. Systems Accountants

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Training Users.	Manuals, Hardware, Software.	Communication.	Overview of system, operational knowledge of terminal.
2.	Advise users on the computerisation of their system and its implementation.	Manuals, Hardware, Software.	Communication with users, accounts clerk, etc. Organisational.	Computer operation and procedures, User's accounting and business system.
3.	Stationery.	-	Organisation, ordering, communication.	Stationery needs.
4.	Provide support services for hardware and software.		Communication.	Computer operation and procedures, User's accounting and business system, where to obtain technical support.

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10. Auditor

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Investigate proposals for control systems in new applications and recommend changes where desirable.	Manuals.	Read and understand system documentation. Access adequacy of controls within the system, test controls, write program specifications, communications.	Auditing techniques, hardware and its capabilities, and security facilities, software system, company audit standards general principles and practise of accounting, especially financial auditing.
2.	Review System changes and application systems.	Manuals.	Read and understand system documentation. Access adequacy of controls within the system, test controls, write program specifications, communications.	Auditing techniques, hardware and its capabilities, and security facilities, software system, company audit standards general principles and practise of accounting, especially financial auditing.
3.	Ensure manuals are updated.	Manuals.	Read and understand system documentation. Access adequacy of controls within the system, test controls, write program specifications, communications.	Auditing techniques, hardware and its capabilities, and security facilities, software system, company audit standards general principles and practise of accounting, especially financial auditing.
4.	Investigate problems, recommend solutions.	Manuals.	Read and understand system documentation. Access adequacy of controls within the system, test controls, write program specifications, communications.	Auditing techniques, hardware and its capabilities, and security facilities, software system, company audit standards general principles and practise of accounting, especially financial auditing.
5.	Maintain an awareness of current trends in EDP audit.	Manuals	" " " "	" " " "

N.B. This position was only at large computer installation. This company also had other similar positions, one specialising in "quality assurance" and the administration of pre-production testing etc. Another position, an Operational Auditor, functioned at a lower level, conducting audit reports, collating information, etc.

11. Technical Service Leader

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Advise, assist and educate EDP staff (Programmers and Operators, etc).	Software manuals, terminals, reports examples.	Communication.	Hardware, software, programming languages, installation standards.
2.	Diagnose and provide solutions for problems when and if they occur	Dumps, log summary programs, software documentation, terminals.	Define problem, methodalogy to solve problem.	Hardware, programs, system, tools to determine problems.
3.	Implement/maintain.	Software tapes, system software patches, terminals.	Compile system software with applicable patches test, inform users of relevant changes enhancements.	Ramifications of the systems software, programming languages, utilities to apply patches, system, WFL, JCL, etc.
4.	Liaise with vendor regarding software problems.	Dumps, field communication report.	Define software problem, communication.	Program dumps, system dumps.
5.	Provide technical support to users and EDP staff.	Software documentation terminals, programs and utilities.	Write and test utilities, provide alternatives and lay down guidelines for operating procedures and programming practices.	Refer to Task (1).

6HA

6HB

12. Database Administrator

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Ensure continuous operation and maintenance of database activities.	Manuals, documentation.	Design and test recovery procedures, monitor database and tune its performance, problem analysis and solution.	WFL, JCL etc, kind of operations using the database operational knowledge.
2.	Design and develop database.	Manuals, documentation.	Design, develop and implement databases, use DB programming tools and languages, data modelling techniques, form procedures.	Relationship between data capabilities of DB software, retrieval techniques, databases logical and physical structure.
3.	Support for management, system development and operations.	-	Provide consultancy, communication, recognise security weaknesses.	Expertise in all aspects of database
4.	Maintain DB documentation and accountability,	Manuals, documentation, software tools.	Assembly, recording and reporting data.	DB requirements.
5.	Determine future DB progress.	Journals, literature, industry vendors.	Research and evaluate products.	

COMMON ADDITIONAL TASKS

6.	Train staff.	Manuals, system specifications.	Communication, training.	Database, software and system.

6HC

6HD

13. Design Authority/Data Administrator

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Define system requirements.	Hardware and software manuals.	Communication, interpersonal data definition.	Design methadology, current systems design, organisations and how they function, database management. operating system.
2.	Design the database.	Hardware and software, manuals.	Map the data model onto a database design, sizing and performance skills.	" " " "
3.	Design the overall processing environment.	Manuals.	System design, programming.	" " " "
4.	Quality check, detailed specifications.	Hardware, software, manuals.	Quality control.	" " " "
	COMMON ADDITIONAL TASKS			
5.	Design testing equipment.	Hardware, software, manuals.	Program testing.	" " " "
6.	Produce security, contingency design and plans.	Hardware, software, manuals.	Systems design.	" " " "
7.	Promote/enforce standards with respect to data definition.	Hardware, software, manuals.	Communication, data definition, and administration.	" " " "

14. Data-Processing Manager

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Know and respond to nees of the organisation.	-	Communication, Observation, Interpersonal.	Overall knowledge of installation.
2.	Record all problems or aspirations from minutes, memos, reports/studies.	-		Language skills - writing articulating.
3.	Feed information back to users.	-		
4.	Assign priorities, planning approach.	-	Communication/interpersonal. Cost/benefit evaluation. Assessment of anticipated tasks (time/skills required). Drawing bar-charts. Other visual aids, management.	Operational, organisation knowledge of available resources, time/resource analysis. Planning techniques.
5.	Supervision.	-	Putting planning into operation. Reviewing planning, investigating and remedying slippages.	
6.	Systems Analysis.	-	Feasibility surveys, requirement specifications, system design, program specifications.	Knowledge of business, organisation, language, presentation, file construction.
7.	Writing reports, maintaining priority lists, task sheets.	Word Processor.	System design, program specifications.	Knowledge of business, organisation, language, presentation, file construction.

N.B. There would be many possible variations for this position both in terms of management and data processing levels and in terms of the balance between the management and data processing roles. The above is a balance of these features.

15. Software Support Advisor/Monitor

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Identify the nature of software problems.	Manuals.	Interpersonal communication, interpret user's needs, software problem identification.	Programming languages, W.L. JCL etc, user's environment and business procedures, what the program is meant to do, operating system.
2.	Solve Software problems or refer to support.	Manuals.	Interpersonal communication, interpret user's needs, software problem identification and design, code and test programs.	" " " "
3.	Liaise with customer and/or with relevant departments.	-	Communication, record problems, administrative.	" " " "
	COMMON ADDITIONAL TASKS			
4.	Issue or install software to customers and keep records.	Manuals.	Interpersonal communication, interpret user's needs, software problem identification and design, code and test programs. Administration, communication.	" " " "

N.B. This position is similar to that of Systems Programmer but at a lower level with the emphasis on software problem identification.

16. Software Support Consultant

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Identify customer development opportunities produce and implement account development plans, advise.	Manuals, reports, listings, terminals, documentation, data transmission, hardware.	Technical planning, communication, interpersonal, design, code, test.	Business environment and procedures, computer company's products and capabilities.
2.	Install, upgrade and maintain software on internal systems and customer sites.	" " " "	Read and understand technical information.	" " " "
3.	Provide technical support and resolve problems.	" " " "	Diagnose faults, read dumps, modify communication.	" " " "
	COMMON ADDITIONAL TASKS			
4.	Liaise with parent company support to obtain repairs and forward own repairs for adoption.	" " " "	Communication, write code.	Business environment and procedures, computer company's products and capabilities and knowledge of parent company's organisation.
5.	Maintain knowledge of own and other companies products and their inpact on the business environment.	Manuals, technical information, etc.	Read and understand technical information.	Technical information resources.
6.	Participate and develop proposals and presentations.	-	Technical planning, communication, interpersonal, design, code, test.	Business environment and procedures, computer company's products and capabilites and knowledge of parent company's organisation.

16. Software Support Consultant Continued

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
7.	Supervise and/or train staff.	-	Supervisory training interpersonal organisation.	Business environment and procedures, computer company's products and capabilities.

N.B. The Software Support Consultant described is a position within a computer manufacturer/vendor organisation and a necessary part of the overall sales/marketing/support/service network. The position is similar to that of Systems Programmer but requiring greater specialisation.

17. Systems Consultant

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Sales support.	-	Liaise with clients.	Technical knowledge of product.
2.	Systems Design.	-	Breakdown into tasks, integrate tasks into workable system.	Software/hardware interface, how hardware works.
3.	Manual preparation.	Word processor, drafting facilities.	Written English.	Techncial design requirement.
4.	Programming.	Word processor, macroprocessor compiler, interpreter, etc.	Programming.	
5.	Testing.	Manuals, CPU.	Identify faults, logical approach.	
6.	Staff management.	Manuals.	Advise staff, supervise tasks, evaluate ability of staff, problem resolving.	What project deadlines to achieve, when people need backup.
7.	Administrative Database.	Telephone.	-	-
8.	Fault fixing.	-	Obtain information to solve fault.	

18. Sales Consultant

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Maintain product awareness.	-	Read and understand technical information.	Company's products and capabilities or packages, etc, directions and strategies.
2.	Maintain customer contact.	-	Maintain and extend level of contact within the client's organisation, communication, interpersonal, organise.	Company's products and capabilities or packages etc, directions and strategies, client's industry, business environment and procedures.
3.	Be aware of industry trends and competition.	-	Read and understand technical information.	Computer industry, marketing and business principles.
4.	Sell.	-	Indentify/create prospects, formulate selling plan, cost, communication, organise.	All of the above.
5.	Maintain customer satisfaction.	-	Pick up loose ends, ensure effectiveness of service.	All of the above.

N.B. This position is found within larger Software Houses and Computer manufacturer/vendor companies.

19. Software

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Coordination of available resource against requirements.	-	Time and resource management.	How support functions within the company and what the objectives are.
2.	Promotion of customer satisfaction.	-	Communication, problem management, analyse issues into tasks to resolve problems.	Company procedures. Customers business and political issues within the organisation, the situation of the company account.
3.	Technical vetting of sales proposals/systems validations.	-	Technical or delegation.	Company products, procedures, and policies.
4.	People management (training/appraisal etc)	-	Communication/interpersonal.	Understanding of people.
5.	Expenditure/cost, revenue control.	-	Read and understand accounting reports, forecasting, budgeting.	Basic business management, financial control.
6.	Liaison with other parts of the region/company.	-	Communication/interpersonal.	Company business and objectives and other departments.

20. Marketing Executive

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Coordinate competitive information.	Financial statements, press reports.	Analyse trends, design market strategies, communication/interpersonal, organisation, presentation.	Computer industry and own company in particular.
2.	Business planning.	Market forecasts, industry studies.	Produce 5 year plan, long term strategic objectives for the company, strategic, management planning and marketing.	Computer industry and own company in particular, company organisation - - cost structure - business procedures - profits - directions and strategies.
3.	Market survey.	-	Initiate/coordinate and interpret market surveys.	Market research - - research parameters.

21. Product Manager

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Produce and update marketing plans.	Research results, internal marketing documents, international price manuals, management reports.	Communication/interpersonal, write reports, sales/ marketing - - distribution channels - price levels - product info - monitor sales and targets and profit margins.	Thorough understanding of the company product range, competitor's products and operations, company operations, policies and strategies, economics, business climate.
2.	Issue product information bulletins.	Source documents, feedback from sales.	Writing, collating.	" " " "
3.	Represent NZ view of market - products to overseas developments divisions.	Sales	Monitor progress of plans, formulate amendments, gather and disseminate info.	" " " "

22. Service Manager (Software Supply Company)

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Mainframe performance monitoring.	Terminal, software tools.	Interpret software reports, identify inefficiencies, recommend action.	Technical knowledge of mainframe or CPU and software.
2.	Plan and execute network enhancements, Software fixes, hardware additions.	-	Identify need for changes, liaise with relevant agencies, plan course of action, irform management and clients, monitor effects.	As above.
3.	Liaise with network users.	Memo, terminal, letter, telephone.	Dissemination of information from management, software development to users.	
4.	Report to management.	Daily fault logs, monthly logs, user reports	Compile fault reports into monthly report, highlight problems.	
5.	Provide assistance to and train remote network users.	Manuals, terminals, telephone.	Write manuals, compile information.	
6.	Liaison with hardware suppliers.			

23. Service Manager (Computer Manufacture/Supply Company)

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Plan staff technical training.	Course listings, career guides.	Be aware of staff's abilities, organisation.	Machine population and training facilities available.
2.	Maintain site responsibilities/skills ratio.	Site/skills listings.	Organisation, monitor and relocate when required.	Machine population.
3.	Plan, implement and adjust preventative maintenance sessions according to needs and priorities.	Listings and stopwatch facilities.	Schedule, plan and coordinate with customers, organisation.	Equipment and time required to do the maintenance.
4.	Plan installations, upgrades and removals of hardware.	As above and company documents.	Planning, liaise with customers - for installation, upgrade, removal of equipment, communication.	Manuals and procedures.
5.	Compile rosters for after hours service, allocate leave.	Stopwatch facilities and listings.	Organisation.	-
6.	Respond to engineers' service problems after hours.	-	Organisation.	
7.	Assist engineers product action plans for problem situations.	Fault history.	Organisation.	Minimum technical knowledge.

23. Service Manager (Computer Manufacture/Supply Company) Continued ...

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
8.	Attend site reviews, customer contact meetings.	Previous minutes, site history.	Communication.	Customer's systems.
9.	Review work loads in region on hourly basis.	Stopwatch on live video.	Organisation.	Service desk procedures.
10.	Give guidance to stopwatch service desk in event of failure to meet response times.	Stopwatch on live video.	Organisation.	Customer's systems.

24. Systems Software Engineer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Maintain and improve existing network software.	Manuals, documentation, design, sheets.	Write specifications, code, test, communication planning.	Telecommuications procedures, photocals equipment, (in-depth), interaction of systems, company methods and systems, marketing principles.
2.	Design and develop new software.	Manuals, documentation, design sheets.	Write specifications code, test, communication planning, define and develop interfaces for new hardware or software products. Predict effect changes will have on system. Plan hardware and software requirements.	As above and microprocessor, hardware and software knowledge, hardware design and manufacture, up to date knowledge of technical advances that may affect the network.
3.	Design and develop microprocessor based hardware.	Manuals, documentation, design sheets, design tools.	As above.	As above.
4.	Ensure the correct operation facilities within the network.	-	As above.	As above.
5.	Make recommendations on the future direction of the network.	-	Evaluate new hardware for network use.	As above, and company director future needs.

25. Support Engineer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Assist engineers in fault-finding hardware and software problems.	Manuals, logic diagrams, logic analyser, oscilloscope, dump, data scope, test software.	Logical approach to problems, use diagnostic tools, run test software, communication with managers and customers.	General understanding of what trying to achieve, how to use diagnostic tools and test equipment.
2.	Provide on the job training and formal training for engineers.	Manuals, test equipment, logic diagrams, test software, use software.	Training.	Detailed knowledge of equipment training for.
3.	Advise management on potential problems and problem areas.	Info-sheets, technical literature.	Reading/listening, communication - verbal and written.	General understanding of the machines.
4.	Increase customer satisfaction.	As above.	As other tasks.	As other tasks.
5.	Design and organise special solutions to out of spec. customer requirements.	As above.	Organisation, design, electronics and software.	Good understanding of the equipment, its capabilities and specifications, company rules on the use of equipment.
6.	Installation of equipment.	Manuals, test equipment, test software.	Organisation of equipment.	If problems, return to (1).

N.B. This position exists within computer manufacture/supply companies. The position can however, be a part of a large computer installation. The emphasis however, would be more placed on special design and service work and coordinating and liaising on computer hardware adminstration. The skills and knowledge are essentially similar.

26. Systems Engineer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Prepare estimates for tenders and proposals.	-	Define tasks, estimate time equipment requirements, provide personnel costing.	Estimates from previous work.
2.	Prepare design specifications.	Word processor, plotter.	Discuss project with staff, design hardware and software, document proposed approach.	Background of project and client.
3.	Design hardware.	Drawing board, device data books.	Technical drawing, mechanical design, circuit board layout.	Hardware function, electronic theory, electronics available.
4.	Supervise, hardware construction.	-	Order components, monitor delivery of components, instruct technicians, monitor technical progress, document construction.	Construction method, cost efficiency analysis of outside work.
5.	Hardware construction (When technician available).	-	Soldering, metalwork.	Assembly techniques.
6.	Software implementation.	Micro Computer Maintenance.	Structured design methodology, breakdown into small tasks, code, tests, debug, document.	Programming languages, Standard Algorithm.

27. Microprocessor Systems Designer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Design a microprocessor based system for use in the network.	Semi-conductor, data books, micro-processor development system, prototype construction tools, equipment and components.	Define and analyse project requirements, cost the project, partition hardware and software functions, design evaluate and refine prototype hardware and software, develop a printed circuit board, evaluate new components, etc. Communication, write technical documentation and reports.	Expert knowledge and practical experience in microprocessor, hardware and software construction and application, latest developments in micro-processing technology, sources of production for components.

28. Service Engineer

	TASK	EQUIPMENT USED	SKILLS REQUIRED	KNOWLEDGE REQUIRED
1.	Machine repair.	Oscilloscope, tools, test equipment, manuals, spare parts.	Use tools, find problem area, replace faulty part.	Electronics, components, Hardware operating system languages.
2.	Board repair in office.	Oscilloscope, tools, manuals.	Soldering, use data scope, replace component, etc.	Components.
3.	Machine installation.	Tools, manuals.	Communication, organisation, limited electrician's registration.	Thorough knowledge of machine.
4.	Machine modifications.	Manuals, tools.	As (2) and (3).	Approved changes.
5.	Maintenance.	Manuals, tools.	Test equipment, voltage etc, clean.	Hardware.

N.B. There are various gradings for engineers - Trainee, Engineer 2, Engineer 3, Engineer 4, Senior Engineer etc. The skills and knowledge required for these would only differ in detail and application. The Senior Engineer would have some administrative and or training tasks.

CONFIDENTIAL

VTC EDP SKILLS ANALYSIS

STANDARD INTERVIEW SCHEDULE

PART ONE : GENERAL

1.1 Job Title .....

1.2 Department .....

1.3 Age .....

1.4 Sex .....

1.5 Responsible to .....

1.6 Responsible for .....

2.1 How long have you been in your present job? F/T ..... P/T .....

2.2 Have you held any other jobs in this organisation? Yes/No

2.3 If yes, which ones?

(a) ..... (d) .....

(b) ..... (e) .....

(c) ..... (f) .....

2.4 How many years work experience have you had in this organisation? .....

3.1 Did you have any computer work experience before joining this organisation?

Yes/No

3.2 If yes, what did you do?

(a) .....

(b) .....

(c) .....

(d) .....

3.3 So how many years work experience in the computer industry have you had outside of this organisation?

.....

4.1 What educational qualifications do you hold?

Highest School Qualification .....

Technical Institute .....

.../2

University (degrees & majors) .....

Other .....

4.2 Did your highest educational qualification adequately prepare you for work in the computer industry? Yes/No *(If appropriate)*

4.3 If no, what was lacking in your formal education?

.....

.....

.....

5.1 Have you attended any courses during service in this organisation? Yes/No

5.2 If yes, which ones in-house? By outside organisations?

(a) ..... (a) .....

(b) ..... (b) .....

(c) ..... (c) .....

(d) ..... (d) .....

5.3 Did they help you do your job better? Yes/No

5.4 If yes, how did they help you do your job better?

(a) ..... (a) .....

(b) ..... (b) .....

(c) ..... (c) .....

(d) ..... (d) .....

5.5 Have you had any on the job training? Yes/No

5.6 If yes was it formal/informal?

5.7 If yes, how did they help you to do your job better?

(a) .....

(b) .....

(c) .....

(d) .....

5.8 Which training was best? .....

PART TWO : JOB ANALYSIS AND TRAINING NEEDS

(Note to interviewer. Please use the completed task sheets and their job descriptions for this part of the interview. Please go through seeking answers to the following questions. Put the answers on the job analysis sheets.)

6. What do you need to be able to do to do each task?

7. What do you need to know to do each task?

8. What are the standards of performance for each task?

9. What equipment do you use?

10. Were you trained for each task?

11. Do you need more training for each task?

PART THREE : CAREER DEVELOPMENT

12. On the whole, how well trained do you think you have been for your present job?

.. ..

.....

.....

13.1 What do you like about your present job? .....

.....

13.2 What do you dislike about it? .....

.....

13.3 Do you see your best opportunity for development

(a) within this organisation?

(b) by moving around different organisations?

13.4 Have you any intentions of leaving the company in the foreseeable future? Yes/No

13.5 If yes, what would the company have to do for you to stay? .....

.....

.....

13.6 If promotion is desired, can you list the career path you would choose?

(a) ..... (d) .....

(b) ..... (e) .....

(c) ..... (f) .....

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14. Do you have any suggestions about improving training for computer personnel?

(a) at school? .....

.....

(b) at institutes? .....

.....

(c) at university? .....

.....

(d) on the job? .....

.....

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15. Is there anything else about your training and development that we haven't touched on, but that you would like to discuss?

.....

.....

.....

.....

GENERAL COMMENTS

MEMORANDUM

TO: ALL EDP STAFF Please Read Carefully

FROM: DATE:

EDP SKILLS ANALYSIS RESEARCH

Reasons for the Research

The research is being undertaken on behalf of the Micro Electronic Technology Advisory Committee of the Vocational Training Council. The Council is a statutory body responsible for making recommendations to the Government on the training and development of the New Zealand workforce.

The aim of the research project is to provide the Advisory Committee with details of the skills and knowledge used by EDP personnel and to provide some information on the training and development of computer staff. The research will provide the Advisory Committee with valuable information which may be used for the development of computer studies curricula.

Method

(1) Please arrange for a photocopy of your Job Description, if available, to be left with the researcher.

(2) Complete a Computer Task Sheet, prior to the day of interview. An example is attached. Please note that you are required to break down each task for which you are responsible, and write down the equipment used and the key steps in each task.

(3) An interview time will be arranged, which should take about one hour. Both your Job Description and completed Computer Task Sheet will be needed.

N.B. The interviews will be confidential to the researcher but a report on the project will be made available to the company.

Dates

The interviews are scheduled to take place during the period of:

MANAGEMENT INTERVIEW SCHEDULE

1. Name of department .....
2. Number of staff .....
3.1 In recruiting staff, what educational qualifications are you looking for?

3.2. And what personal characteristics?

4.1. In your department, do you have any difficulty in recruiting suitably trained staff? Yes/no
4.2. If yes, what is the problem?

5.1. For the purpose of your department, do you find the pre-employment training of computer personnel adequate? Yes/no
5.2. If no, how could it be improved?

6.1. For the putpose of your department, do you find the in-company training of staff adequate? Yes/No
6.2. If no how could it be improved?

7.1. Are there adequate opportunities for staff development within the organisation? Yes/no
7.2. If no, please comment on how it could be improved

8. What is the main career pathway for staff moving out of your department?

EXAMPLE ONLY.

COMPUTER TASK SHEET

TASK	EQUIPMENT	STEPS IN EACH TASK
Changing high-speed printer	1. IBM 1403 2. IBM 3211 3. CDL 28211	(a) Stop printer (b) Open printer lid and gate (c) Remove old ribbon (d) Fit new old ribbon
Design and Code Program	Program Specification including: Data Specifications/descriptions	(a) Read program specification for overview (b) Read program specification for details of data usage/processing (c) Study data specifications and produce record descriptions for program (d) Develop data structure diagrams (e) Produce program structure diagram (f) Produce list a operation

COMPUTER TASK SHEET

TASK	EQUIPMENT USED	STEPS USED IN EACH TASK